12/4/17

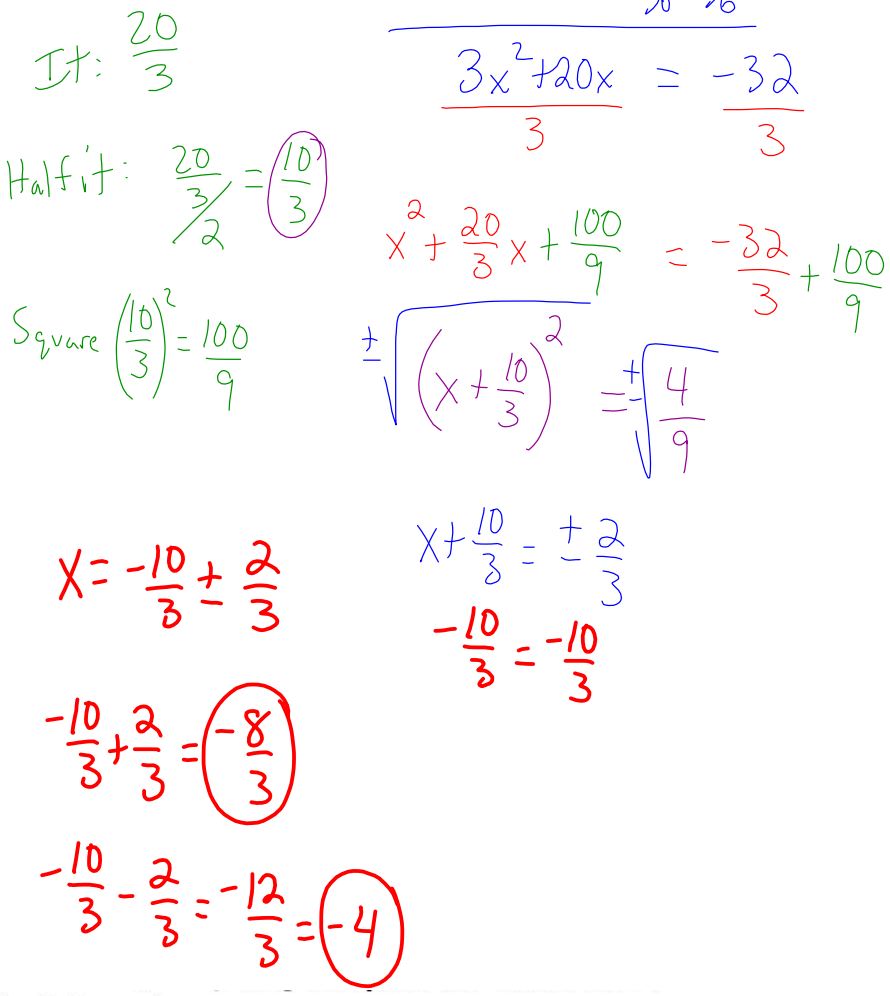
"Our greatest weakness lies in giving up. The most certain way to succeed is always to try just one more time." -Thomas Edison

HW: Worksheet "Solving Rational Inequalities" #3, 5, 7, 9*

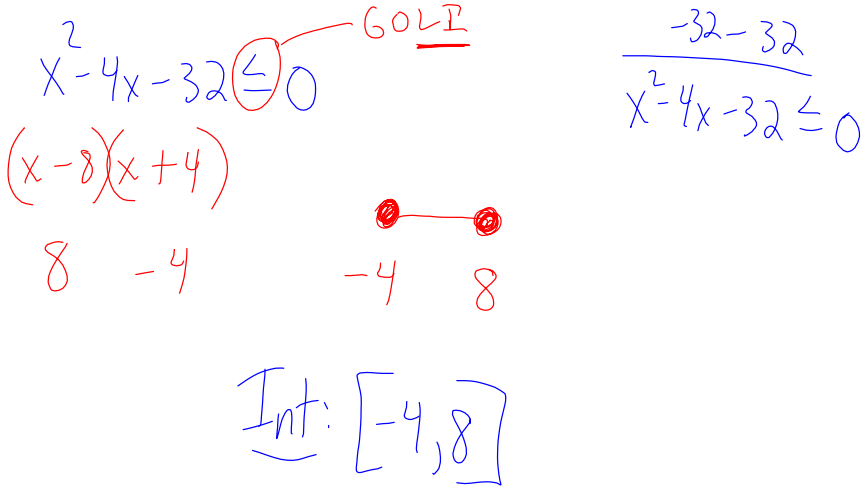
AIM: How do we solve Rational Inequalities?

Warm Up:

1. Solve by completing the square: $3x^2+20x+36=4$



2. Solve and express your answer in interval notation: $x^2-4x\le 32$



Rational/Quadratic

Guidelines for solving ~~nonlinear~~ inequalities:

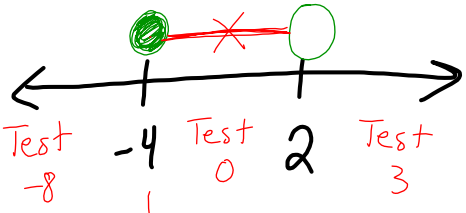
- Move all terms to one side of the inequality. (If dealing with rational expressions, get a common denominator.)
- Factor completely.
- Set each factor equal to zero. These numbers will divide your number line. (Denominator critical values ALWAYS get an open circle)
- Make a sign chart by dividing the number line into intervals found in step 3.
- Use a test value to determine the sign in each interval.
- Determine the solution of the inequality by examining the sign values.

For each inequality below, express its solution set 3 ways:
(a) As a number line.
(b) Using set-builder notation.
(c) Using interval notation.

1) $\frac{x+4}{2-x} \geq 0$

$x+4=0$ $\quad 2-x=0$
$x=-4$ $\quad +x \ +x$
closed circle $\quad 2=x$
open circle

a)



$\frac{-8+4}{2--8} \geq 0$ $\quad \frac{0+4}{2-0} \geq 0$ $\quad \frac{3+4}{2-3}$

$\frac{-4}{10} \geq 0$ $\quad \frac{4}{2} \geq 0$ $\quad \frac{7}{-1} \geq 0$

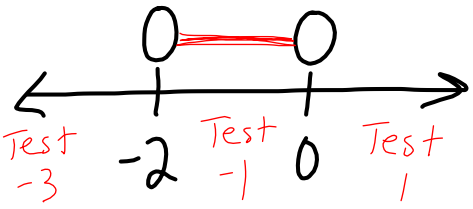
No! $\quad$ Yes! $\quad$ No!

b) SB: $\{x \mid -4 \leq x < 2\}$

c) Int: $[-4, 2)$

2) $\frac{x}{x+2} < 0$

$x=0$ $\quad x+2=0$
open circles $\quad x=-2$
open circles



$\frac{-3}{-3+2} < 0$ $\quad \frac{-1}{-1+2} < 0$ $\quad \frac{1}{1+2} < 0$

$\frac{-3}{-1} < 0$ $\quad \frac{-1}{1} < 0$ $\quad \frac{1}{3} < 0$

$3 < 0$ $\quad$ Yes! $\quad$ No!

No!

SB: $\{x \mid -2 < x < 0\}$

Int: $(-2, 0)$

3) $\frac{6}{x-3} > 0$

6) $\frac{(6-x)(3+x)}{x+1} \leq 0$